

Ing. Dounia SEDIAME

Contact Information

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- Work Permit Yes
- Github <https://github.com/sediame>

Profile Summary

- Experience of working in a scientific research lab collaborating with various research teams and scientists for smooth execution of research projects.
- Educated as Engineer of Thermal Energy with additional Master of Research in Thermal Energy.
- Experience of research publications with two papers published in reputable international journals and conferences.
- Experience of applying data analysis techniques for large scale scientific data of thermal imaging and fluid mechanics generated in the research lab and presenting output results.
- Participant of Kaggle data science competitions analysing different dataset and applying machine learning technique.
- Expertise of design and optimization of systems and industrial processes for energy conservation within heat transfers installations.
- Expertise of dimensional analysis of new energy generating equipment to predict, innovate and achieve maximum energy efficiency.
- Experience of working in different industries including manufacturing, maintenance services and distinguished research labs.
- Expertise of prototyping with numerical simulation using tools like Matlab and Comsol for understanding problems.

Education and Training

Master of Research in Thermal Energy (2011 - 2013)

- Ecole Polytech, University of Nantes (France)



Master in Engineering - Thermal Energy (2008-2011)

- Ecole Polytech, University of Nantes (France)

Higher National Diploma in Thermal Energy (2006-2008)

- University of Pau (France)



Online Coursera / edX Courses (2018)

- Python for Data Science
- Statistics for Business

Work Experience

Laboratoire Thermocinétique de Nantes (France)

Position: Research Internship Thermal Energy

Business Sector : Professional, scientific and technical activities

Time Period: 10/04/2012 to 10/7/2012



Key Responsibilities

The internship work included thermal analysis of the effects of a neutralization reaction in an acid-based multifunctional micro-exchanger. The project is to implement a new tool for efficient thermal measurement and providing information to the micrometer scale. The Thermal Infrared (TIR) is a technique that can measure distance without contact and the temperature distribution of an object from its infrared emission. The objective of this work is to not only measures temperature but also heat flow to analyze the thermal effects of discharges of chemical reagents (enthalpy). The general idea is to measure the heat flow using the method of normal gradient. Therefore two temperature distributions are necessary for different distances x from the fluid / wall in which the distribution of heat flux is desired interface. The idea is to use a material that is transparent in the range of measurement of the infrared camera and is opaque to the radiation corresponding to the temperatures found in the fluid in the microchannel to be a transfer of substantially conductive type within material. This device is quite original in the literature regardless of the science (not just microfluidics).

Keywords: Microfluidics, Thermal Data Analysis, Micro-exchanger, Thermal Infrared, Enthalpy Temperature, Heat Flow

Abcar DIC Process (France)

Position: Internship-Engineer Thermal Energy

Business Sector : Manufacturing

Time Period: 1/02/2011 to 1/07/2011



Key Responsibilities

The internship was with a hi-tech company which manufactures industrial machines. The company aims to showcase its non-traditional portfolio to various industrial sectors located in Africa. The project consisted of the following two independent tasks

- Design of a system to generate electricity autonomously using solar energy or fuel for clients in Africa.
- Second task was to design a tray dryer with a 1000×500 mm with a gantry carrying a back-and-forth along the tray with a traveling speed of between 0.2 and 1.5 m/s.

Keywords: Industrial Machines, Solar Energy, Fuel, Speed, Design, Optimization

University of Teerthanker Mahaveer (India)

Position: Internship

Business Sector : Education

Time Period: 01/06/2010-01/09/2010



Key Responsibilities

The problem was concerned with installation and design feasibility of solar panel for an auto rickshaw (wheeled passenger cart) such that utilization of solar energy with feasible panel size can be maximized. It was a two pronged task. First task required generation of feasibility of the design of photovoltaic panel for three cases of Rickshaw. Second task required creation of an tool in excel to calculate design feasibility of photovoltaic installation in some cities in India, with the intention of making the solar design approachable by common public.

Keywords: Solar Panel, Photovoltaic , Design

Ventec Maroc

Position: Internship

Business Sector : Electricity, gas, steam and air conditioning supply

Time Period: 01/04/2008- 01/07/2008



Key Responsibilities

The theme of this work was to familiarize themselves with the different air conditioning systems. It includes drawing a refrigeration cycle in an enthalpy chart using thermodynamic measured before and after the maintenance of a water chiller. Finally after using the thermodynamic relations, it is required to calculate the COP in both cases and compare them in order to show the importance of maintenance in the performance of a system.

Keywords: Air Conditioning, Refrigeration, Enthalpy, Thermodynamic

Programming Languages

Python, SQL, Matlab

Software Libraries and Tools

Pandas, Numpy, Scikit-learn, Matplotlib, Jupyter
Thermoptim, Gimp
Pléiades-COMFIE
COMSOL Multiphysics
Fluent
Autodesk Inventor
Microsoft Office
Open Office
Linux, Windows

Operating Systems

Language Skills

- French (Fluent)
- English (Advanced)
- German (Level B1)
- Arabic (Native)

Publications

Title: *“HEAT TRANSFER ANALYSIS AND IMPROVED MIXING OF REACTANTS IN MULTIFUNCTIONAL MICROREACTOR”*

ABSTRACT

This work is devoted to heat transfer analysis and mixing intensification of reactants in micro channel. On the one hand we measure the 2D heat flux generated by chemical reaction HCL/NaOH with an IR camera by doing simultaneous temperature measurements on both sides of a sapphire plate in contact with the fluid flow. The reaction takes place in a T-shaped rectangular microchannel ($500\mu\text{m} \times 50\mu\text{m} \times 38\text{mm}$) made of PDMS and closed with a 1 mm thick sapphire plate coated with an opaque dielectric layer on the fluid side and a striped one on the other side. It is shown that using this heat flux distribution measurement, it is possible to obtain the reaction enthalpy of a well known neutralization reaction. The second objective of this work is to intensify the mixing of chemical species without modifying the geometry of the micro reactor. For this purpose, we investigate experimentally the effect of flow pulsation on the mixing of acid base chemical species. The mixing of HCl and NaOH reactants is assured by time-pulsed flows with small Reynolds numbers. The effect of mixing is observed through the location, along the microchannel, where the temperature close to the fluid/wall interface reaches its maximum value. It is shown that the mixing efficiency depends strongly on the ratio between the amplitude and the mean value of the modulated flow rates. It also appears that the mixing is enhanced if the frequency of the periodic inlet flows is increased from 1.25 Hz to 5 Hz so for increasing strouhal number.

Keywords: Micro-channel, Infrared Thermography, Microfluidic, Heat flux, Temperature, Active mixing.